**RET/13/Test B**

**986 | Petroleum Geo-Science**

Question Booklet No. .....

*(To be filled up by the candidate by **blue/black ball-point pen**)*

**Roll No.** | | | | | | | | | |

**Roll No. (Write the digits in words)** .....

**Serial No. of OMR Answer Sheet** .....

**Day and Date** ..... .....

**(Signature of Invigilator)**

## INSTRUCTIONS TO CANDIDATES

(Use only ***blue/black ball-point pen*** in the space above and on both sides of the ***Answer Sheet***)

1. Within 10 minutes of the issue of the Question Booklet, Please ensure that you have got the correct booklet and it contains all the pages in correct sequence and no page/question is missing. In case of faulty Question Booklet, bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall ***except the Admit Card without its envelope.***
3. ***A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided.***
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. ***On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.***
6. ***No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and Roll No. and OMR sheet No. on the Question Booklet.***
7. ***Any changes in the aforesaid-entries is to be verified by the invigilator, otherwise it will be taken as unfair means.***
8. ***This Booklet contains 40 multiple choice questions followed by 10 short answer questions. For each MCQ, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet. For answering any five short Answer Questions use five Blank pages attached at the end of this Question Booklet.***
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. ***Note that the answer once filled in ink cannot be changed.*** If you ***do not wish to attempt*** a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. Deposit ***both OMR Answer Sheet and Question Booklet*** at the end of the Test.
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

**Total No. of Printed Pages : 15**

**FOR ROUGH WORK**

# Research Entrance Test – 2013

**No. of Questions : 50**

*Time : 2 Hours* *Full Marks : 200*

*Note :* (i) This Question Booklet contains **40** Multiple Choice Questions followed by **10** Short Answer Questions.

(ii) Attempt as many MCQs as you can. Each MCQ carries **3 (Three)** marks. **1 (One)** mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question. If more than **one** alternative answers of MCQs seem to be approximate to the correct answer, choose the closest one.

(iii) Answer only 5 Short Answer Questions. Each question carries **16 (Sixteen)** marks and should be answered in **150-200** words. Blank **5 (Five)** pages attached with this booklet shall only be used for the purpose. Answer each question on separate page, after writing Question No.

1. Most of the land precipitation and evaporation on earth takes place over the :

   (1) land masses

   (2) oceans and seas

   (3) poles of the planet

   (4) subtropical latitudes

2. The downstream portion of a river :

   (1) generally becomes more sluggish

   (2) usually has turbulent flows

   (3) generally is of higher velocity, which is marked by reduced turbulence

   (4) has lower discharges than do upstream portions

3. Which of the following is not a fatty acid ?

   (1) Stearic acid (2) Palmitic acid

   (3) Oleic acid (4) Phenyl acetic acid

4. Which of the following compounds is not an antibiotic ?

   (1) Penicillin (2) Chloramine-T

   (3) Streptomycin (4) Chloramphenicol

5. The acceleration with which a particle moves in a straight line, according to the law $v^2 = 4a(x \sin x + \cos x)$, $v$ being the velocity of the particle at a distance $x$ from a fixed point, is :

   (1) 0 (2) $2ax \cos x$

   (3) $4ax \cos x$ (4) $2ax \sin x$

6. If $\begin{bmatrix} 2 & 4 \\ 1 & 3 \end{bmatrix} A \begin{bmatrix} 0 & 2 \\ 1 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then the matrix A is :

(1) $\begin{bmatrix} 3 & -4 \\ 3/4 & -1 \end{bmatrix}$

(2) $\begin{bmatrix} -13/4 & 3/2 \\ 5/4 & -1/2 \end{bmatrix}$

(3) $\begin{bmatrix} -17/4 & 3/4 \\ -7/4 & -1/4 \end{bmatrix}$

(4) $\begin{bmatrix} 5/4 & 11/4 \\ 3 & -9/4 \end{bmatrix}$

7. If the error in the measurement of radius of sphere is 0.3%, then the percentage error in the measurement of its volume is :

(1) 0.15%

(2) 0.6%

(3) 0.9%

(4) 0.03%

8. The resistance of series combination of two resistances is S. When they are joined in parallel, the total resistance is P. If S = nP, then the minimum possible value of n is :

(1) 3

(2) 4

(3) 2.1

(4) 0.89

9. Mitochondria are associated with the function of :

(1) cellular digestion

(2) circulation

(3) protein synthesis

(4) cellular respiration

10. In which parts of eyes, rods and cones are present ?

(1) Retina

(2) Iris

(3) Cornea

(4) Lens

11. Poorly sorted sediments occur in :
(1) Fluvial environment
(2) Beach environment
(3) Dune
(4) Both fluvial and beach environments

12. Leptokurtic curves suggest:
(1) River (2) Desert (3) Lake (4) Ocean

13. Effective settling sphericity is calculated by the formula:
(1) ri/R/N (2) $_3\sqrt{S^2}$/LI (3) $L^2$/SI (4) $\sum fd/x$

14. Wacke-type of sandstones posses:
(1) Grain supported fabric (2) Matrix supported fabric
(3) Unimodel fabric (4) Polymodel fabric

15. Dolomite crystals can be identified on the basis of:
(1) High angle of rhomb
(2) Low angle of rhomb
(3) High refractive index
(4) Both High angle rhomb and high refractive index

16. Which of the following is an infaunal bivalve?
(1) *Pecten* (2) *Lucina* (3) *Lopha* (4) *Pteria*

17. In which of the following microfossil group both calcareous and agglutinated shells are present?
(1) Foraminifers (2) Calpionellids (3) Ostracodes (4) Pteropods

18. Which of the following belongs to fodichnia ichnofacies
(1) *Asteriacites* (2) *Diplocraterion* (3) *Chondrites* (4) *Diplichnites*

19. Which is the oldest trilobite amongst the following?
(1) *Redlichia* (2) *Phacops* (3) *Agnostus* (4) *Trinucleus*

20. In case of sea level rise with high sediment flux, there will be:
(1) Aggradation (2) Progradation
(3) Retrogradation (4) Transgression

21. Which of the following is the correct order of system tracts in a normal depositional sequence?
(1) LST -TST- MFS- HST
(2) LST-HST-MFS-TST
(3) LST- MFS- TST-HST
(4) LST-TST-HST-MFS

22. The erosional unconformity is usually formed due to:
(1) abrupt basinward shift of facies
(2) subaerial exposure and erosion
(3) sea level falls below the shelf break
(4) sea level does not fall below the self break

23. The Anceps Bed belongs to:
(1) Patcham Formation
(2) Chari Formation
(3) Katrol Formation
(4) Umia Formation

24. Select from the following a Maastrichtian horizon:
(1) Ariyalur Group
(2) Spiti Shales
(3) Bagh Beds
(4) Umia Formation

25. Which of the following is not a constituent of Vindhyan Basin?
(1) Kheinjua Formation
(2) Bijaigarh Shale
(3) Otoceras Bed
(4) Bleaching Shale

26. The measure of Rock Eval Pyrolysis as $S_1$ peak is suggestive of :
(1) The amount of hydrocarbons generated through thermal cracking
(2) The amount of $CO_2$ produced during pyrolysis of Kerogen
(3) Hydrozen Index
(4) The amount of free hydrocarbons in the Kerogen

27. Low energy coasts have productivity of organic matter ranging between:
(1) 0.5-5.0%
(2) 0.1-1.0%
(3) 10.0-15.0%
(4) 0.7-1.5%

28. High input of terrestrial organic matter in sediment will result into:
(1) High content of liptinite macerals
(2) High content of vitrinite macerals
(3) High content of fluorinite
(4) High content of exsudatinite

29. During metagenesis
(1) Large quantity of light oil is generated
(2) Large quantity of heavy oil is generated
(3) Large quantity of methane is generated
(4) There is no generation of oil or gas

30. $T_{max}$ > 450°C is suggestive of:
(1) Overmaturity of source of source rock
(2) Immaturity of source rock
(3) High concentration of oxygen in the source rock
(4) High concentration of hydrogeology in the source rock

31. The age of Coal deposits of Meghalaya is:
(1) Oligocene (2) Miocene (3) Eocene (4) Palaeocene

32. Reef as a reservoir is associated primarily with:
(1) Carbonates (2) Sandstone (3) Mudstone (4) Shale

33. Cannel coals are rich in:
(1) Pollen & spores (2) Vitrinite
(3) Inertinite (4) Exsudatinite

34. In limestones orthochems with> 4 μm crystals are known as:
(1) Sparite (2) Micrite (3) Intraclast (4) Oolite

35. A sandstone with> 15% matrix and >95% of quartz is named as:
(1) Greywacke (2) Arkose (3) Quartzwacke (4) Quartz arenite

36. What term best describes a surface across which there has been perceptible displacement?
(1) joints (2) fractures (3) cracks (4) faults

37. Plastic material when stressed beyond a certain critical point called the yield stress flows readily. After unloading (i.e., removing the imposed stress) a plastic material it will
(1) Regain its shape
(2) Only partly regain its shape
(3) Remain distorted or strained
(4) Only partly remain distorted or strained

**38.** What is a dip isogon?

(1) lines joining equal limb dip on adjacent surfaces in a fold

(2) average dip of a fold limb

(3) average limb dip on the adjacent surfaces in a fold

(4) average limb dips in a folded area

**39.** A homogeneous deformation involving either a plane strain or a general strain, in which lines of particles that are parallel to the principal axes of the strain ellipsoid have the same orientation before and after deformation is a

(1) Simple shear (2) Pure shear

(3) A combination of (a) and (b) above (4) Homogenous shear

**40.** Flexural flow folding occurs in

(1) Any homogeneous rock (2) Rocks with ductility contrast

(3) Rocks with the same ductility (4) Any inhomogeneous rock

***Attempt any five questions. Write answer in 150-200 words. Each question carries 16 marks. Answer each question on separate page, after writing Question Number.***

**1.** A critical note on the greywacke problem.

**2.** A note on models of dolomitisation.

**3.** Types of sequence boundaries.

**4.** Describe the two concepts of palaeoecology.

**5.** Triassic stratigraphy of Spiti region.

**6.** A brief account of the outcrop sequence stratigraphy.

**7.** Contents of preservation of organic matters in sediments.

**8.** 1-D modeling in petroleum explorartion.

**9.** Discuss field evidences to identify faults.

**10.** Discuss the stress ellipsoid and the strain ellipsoid with drawings. What is their relationship ?

*Roll No. : .....*

**Q. No. :**

*Roll No. : .....*

**Q. No. :**

*Roll No. : .....*

**Q. No. :**

*Roll No. : .....*

**Q. No. :**

*Roll No. : .....*

**Q. No. :**

**FOR ROUGH WORK**